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I. Real Party in Interest

The real party in interest is Dennis L. Salbilla, individual.

II. Related Appeals and Interferences

Applicant asserts that no other appeals or interferences are known to the Applicant, the Applicant's legal representative, or assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. Status of Claims

Claims 1, 5, 6, 14, 15, 27, 29-32 and 34-38 are pending in the application and stand rejected. Claims 1-26 were originally presented in the application. Claims 2-4, 7-11, 13, 16-26 were withdrawn by the Examiner in the Office Action dated October 6, 2003, for being drawn to a non-elected invention. Claims 18-26 were cancelled and new claims 27-28 were added by Applicant in Applicant's Submission under 37 CFR § 1.114 dated September 3, 2004. Claims 2-4, 7-13, 16, 17, and 28 were cancelled and new claims 29-39 were added by the Applicant in Applicant's Submission under 37 CFR § 1.114 dated October 28, 2005. Claims 33 and 39 were cancelled by the Applicant in Applicant's Response to Final Office Action dated July 26, 2006. The rejection of claims 1, 5, 6, 14, 15, 27, 29-32 and 34-38 based on the cited references is appealed. The pending claims are shown in the attached Claims Appendix.

IV. Status of Amendments

Applicant's proposed amendments to claims 1, 6, 27, 29, and 32 in Applicant's Supplemental Response to Final Office Action dated July 26, 2006, were not entered by the Examiner. All other amendments have been entered by the Examiner and are reflected in the listing of claims shown in the Claims Appendix.

V. Summary of Claimed Subject Matter

The subject matter defined in the claims relates to methods for improved hydrocarbon refining efficiency by preventing the fouling of process components. When process components, such as heat exchangers, are fouled, efficiency is reduced. See, specification at page 11, ll. 1-3. To improve efficiency, an electric charge can be applied to a surface of a process component, such as a heat exchanger, or to a surface of an object near or upstream of the process component. Id. at page 12, ll. 13-15. The effect of the electric charge will be to trap contaminants or otherwise keep the process component or the critical parts of the process component free of contaminant. Id. at page 12, ll. 16-17. Illustrative contaminants include coke, fly ash and catalyst particles. Id. at page 12, line 19. The charge is ideally powerful enough to keep the contaminants/foulants away from the process component (i.e. heat exchanger). Id. at page 13, line 1. As contaminant levels increase, an increase in charge is called for. Id. at page 13, ll. 3-4 and at page 17, ll. 10-15.

The charge can be attractive or repulsive. Id. at page 13, line 4. This charge can be applied through the use of a voltage source electrically coupled (e.g., by a simple wire or other common means) to the target surface. Id. at page 13, ll. 4-7. The attractive or repulsive voltage can be direct (DC) or sinusoidal (AC). Id. at page 13, ll. 7-8.¹ As long as the applied voltage and the resulting charge are of a sufficient magnitude to adequately attract or repel the foulants, it is immaterial whether the voltage is constant or modulated in some way (e.g., sinusoidally modulated). Id. at page 13, ll. 8-11.

¹ See, amendments made to the specification at page 12, line 12 through page 13, line 11 in Applicant's Response to Final Office Action of April 25, 2005.

VI. Grounds of Rejection to be Reviewed on Appeal

The rejection of claims 32 and 35-37 under 35 U.S.C. § 102(b) as being anticipated by Carson (U.S. Patent No. 4,505,758; hereafter "Carson"); claims 1, 5-6, 27, 29-31, 34 and 38 under 35 U.S.C. § 103(a) as being unpatentable over Carson in view of Harms (U.S. Patent No. 3,933,606; hereafter "Harms"); and claims 14-15 under 35 U.S.C. § 103(a) as being unpatentable over Carson in view of Harms, and further in view of Sivavec et al. (U.S. Patent 6,451,210; hereafter "Sivavec") is to be reviewed on Appeal.

VII. Argument

Claims 32 and 35-37 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Carson (U.S. Patent No. 4,505,758; hereafter "Carson"). Claims 1, 5-6, 27, 29-31, 34 and 38 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Carson in view of Harms (U.S. Patent No. 3,933,606; hereafter "Harms"). Claims 14-15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Carson in view of Harms, and further in view of Sivavec et al. (U.S. Patent 6,451,210; hereafter "Sivavec").

Applicant respectfully traverses these rejections on grounds that none of the references, alone or in combination, teach, show or suggest the claimed invention. More particularly, Carson does not teach, show or suggest the claimed invention and expressly teaches away. As such, any combination involving Carson, including those with Harms and/or Sivavec, does not teach, show or suggest the claimed invention. Withdrawal of the rejections and allowance of the claims is respectfully requested.

A. Carson Does Not Teach, Show or Suggest the Claimed Invention and Teaches Away

Carson does not teach, show or suggest the claimed invention requiring the continuous or the continual application of electric charge. Instead, Carson teaches away. The claimed invention relates to a continuous or continual method to prevent fouling of process components within a liquid hydrocarbon stream by applying a continual electric charge to an object within a flow path of the liquid hydrocarbon stream, as required in every claim. The terms "continuous" and "continual" are interchangeable (i.e. synonymous). The plain and ordinary meanings of those terms include "that which recurs repeatedly or goes on unceasingly over a long period of time." See, e.g. Webster's New World College Dictionary 315 (4th ed. 2002). One of ordinary skill in the art would not have understood or have thought that 5 minutes and "preferably less than 1 minute" as taught by Carson would be "a long period of time." Therefore, Carson does not teach, show or suggest a continuous or continual method for foulant prevention.

Considering Carson in more detail, Carson discloses an intermittent method for cleaning heat exchangers after contamination and reduced efficiency as a result thereof. In particular, Carson discloses a process for removing wax buildup on cooler internals by applying an electric current, not electric charge. See, e.g. Carson at col. 3, ll. 41-43. The wax buildup is removed by

resistive heat driven by the electric current, i.e. voltage or power. Suggested voltages are disclosed at col. 3, lines 55-62. Electric charge (i.e. Amps) is not mentioned in Carson. Therefore, it should be inferred that electric charge is not relevant to the process of Carson and therefore, not suggested by Carson.

Furthermore, the heat via the electric current in Carson is applied in intermittent time intervals of less than 5 minutes, not a continual or continuous application, and certainly not "unceasingly over a long period of time." See, e.g. Carson at col. 3, ll. 59-62. Intermittent time intervals do not motivate or suggest a continuous or continual application of charge. In addition, the "continuous application of voltage over a time interval of less than 5 minutes," as argued by the Examiner, does not teach, show or suggest applying a "continual electric charge," as required in the claims. Such suggestion is only based on hindsight. In fact, Carson teaches preferred time intervals of less than one minute. See, e.g. Carson at col. 3, ll. 59-62. It is clear that Carson does not disclose anything of a continual manner. Contrary to the Examiner's assertions, a continuous or uninterrupted process for less than 5 minutes, "preferably less than one minute," is not a "continual" process, as these terms are known in the relevant art. Moreover, a "second application" of the electric current in Carson (see, e.g. Carson at col. 4, ll. 51-60) eliminates any doubt that the process of Carson is intermittent and not a continuous process as required in the claims.

In light of the foregoing, Carson clearly teaches away from a continuous application of electric current. A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path took by the applicant. See In re Gurley, 27 F.3d 551, 31 USPQ2d 1130, 1131 (Fed. Cir. 1994). Being that Carson clearly discloses a quick process (i.e. less than 5 minutes) for heating wax that has accumulated on cooler internals, one of ordinary skill in the art would be discouraged from applying any amount of current for any longer duration.

Absent the Applicant's own specification, there is no evidence of record to teach, show or suggest the claimed invention. A proper reading of Carson, as understood by one of ordinary skill in the art, is an intermittent process for applying heat to clean/remove wax build up, not a continuous process for preventing the wax build. Therefore, Carson does not teach or suggest the claimed invention and expressly teaches away.

B. A Combination of Carson and Harms Does Not Teach, Show or Suggest the Claimed Invention

A combination of Carson and Harms does not teach, show or suggest the claimed invention. As discussed above, Carson does not teach, show or suggest a continuous method for foulant prevention and teaches away. Conversely, Carson discloses an intermittent process for cleaning heat exchangers after contamination and resulting reduced efficiency. Harms does not remedy the deficiencies of Carson. Harms discloses a water treatment process. The disclosure of Harms is not related and has nothing to do with processing a hydrocarbon. Water and hydrocarbons are completely different in terms of polarity, physical properties, volatility and flammability. Therefore, a combination of Carson and Harms does not arrive at the claimed invention.

C. The Examiner Has Not Established a Prima Facie Case of Obviousness in View of Carson and Harms

The Examiner has not established a *prima facie* case of obviousness in view of Carson and Harms. "To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." Ex parte Clapp, 227 USPQ 972, 973 (B.P.A.I. 1985); MPEP §2142. The examiner must *particularly* identify any suggestion, teaching or motivation from *within* the references to combine the references (emphasis added). See In Re Dembiczak, 50 USPQ2d 1614 (Fed. Cir. 1999). The mere recitation of a combination of references does not amount to particularly identifying a suggestion, teaching, or a motivation to combine the references. Further, the teaching or suggestion to make the claimed invention and the reasonable expectation of success must both be found in the prior art, not in the applicants' disclosure. See M.P.E.P. § 2143, citing In re Vaeck, 947 F.2d 488 (Fed. Cir. 1991).

Here, the Examiner states that it would have been obvious "to modify the process of the Carson reference to include an electric charge magnitude adjustment step as taught in the Harms reference in order to effect a desired degree of contaminant removal in the fluid being treated." However, there is no reasonable expectation from the references themselves that the process of

Carson can be modified according to the teachings of Harms, nor has the Examiner established on the record any reasonable expectation for modifying Carson. Carson uses the work (i.e. heat) from short, intermittent applications of voltage to remove or clean accumulated, solidified paraffins within a cooler. An electric charge as a result of the applied current would have no effect on the solidified paraffins. As a result, Carson has no use for electric charge and makes no reference to an electric charge. In fact, a "magnitude adjustment step" in Carson would have no effect on Carson's process of melting accumulated paraffins, which are non-polar. Therefore, the combined teaching of Carson and Harms does not motivate nor suggest making the claimed invention and the reasonable expectation of success is not found in the same combination.

Furthermore, the proposed modification of Carson renders Carson unsatisfactory for its intended purpose. However, the proposed modification cannot render the prior art unsatisfactory for its intended purpose. In re Gordon, 221 USPQ 1125 (Fed. Cir. 1984). If the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. See, In re Gordon, 733 F.2d 900 (Fed. Cir. 1984); MPEP § 2143.01. As discussed above, any longer duration of voltage to the cooler of Carson would impart too much heat and would render the cooler unsatisfactory for its intended purpose which is cooling a process stream. Therefore, the Examiner has not established a *prima facie* case of obviousness in view of Carson and Harms, and insofar as the record shows, the only motivation to combine the teaching of Harms and Carson has been gleaned from the Applicant's own specification, which is nothing more than impermissible hindsight.

D. The Examiner Has Not Established a Prima Facie Case of Obviousness in View of Carson and Harms and Further in View of Sivavec

The Examiner has not established a *prima facie* case of obviousness in view of Carson, Harms, and Sivavec. Claims 14-15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Carson in view of Harms, and further in view of Sivavec. Carson and Harms have been discussed and distinguished above. Sivavec adds nothing to the deficiencies of Carson and Harms. Further, the Examiner has not particularly identified any evidence of record to support a combination of the references. More significantly, a mere combination of the references would render Carson unsuitable for its intended purposes for reasons discussed above.

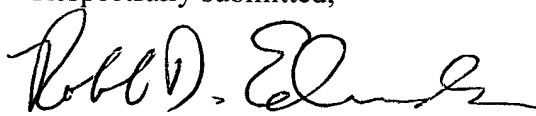
Therefore, the Examiner has not established a *prima facie* case of obviousness in view of Carson, Harms, and Sivavec, and claims 14-15 are in condition for allowance for at least the same reasons stated above with regard to claim 1.

CONCLUSION

The references alone or in combination do not teach, show or suggest the claimed invention. Therefore, Applicant submits that the pending claims are patentable over the references, and respectfully request withdrawal of the rejections and allowance of the claims.

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Respectfully submitted,



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VIII. Claims Appendix

1. (Previously presented) A method for the reduction of fouling of process components within a liquid hydrocarbon stream comprising the steps of:
applying a continual electric charge to an object within a flow path of said liquid hydrocarbon stream, wherein said liquid hydrocarbon stream contains at least one contaminant;
flowing said liquid hydrocarbon stream past said continual electric charge; and then
adjusting the magnitude of said continual electric charge while continuing said flowing step.

Claims 2-4: (Cancelled)

5. (Previously presented) The method according to Claim 1, wherein said object is a heat exchanger.
6. (Previously presented) The method according to Claim 5, wherein said step of applying a continual electric charge comprises applying an electric charge to the chassis or shell of said heat exchanger.

Claims 7-13. (Canceled)

14. (Previously presented) The method of Claim 1, further comprising determining a level of contaminants in the liquid hydrocarbon stream.
15. (Previously presented) The method of Claim 14 wherein said step of determining a level of contaminants utilizes measurement of the turbidity of the fluid stream or an analytical measurement indicative of contaminant concentration of the liquid hydrocarbon stream.

Claims 16-26. (Canceled)

27. (Previously presented) A method for improved hydrocarbon refining efficiency comprising the steps of:

- catalytically cracking a liquid hydrocarbon mixture to produce an output mixture enhanced in low molecular weight liquid hydrocarbons relative to said hydrocarbon mixture;
- separating by distillation said output mixture into petroleum fractions;
- drawing a liquid hydrocarbon stream from said petroleum fractions;
- flowing said liquid hydrocarbon stream through a heat exchanger;
- repeating said step of separating or said steps of catalytically cracking and separating on said liquid hydrocarbon stream;
- applying a continual electric charge to an object within a flow path of said liquid hydrocarbon stream;
- flowing said liquid hydrocarbon stream past said continual electric charge; and
- adjusting the magnitude of said continual electric charge while continuing said flowing step.

28. (Canceled)

29. (Previously presented) A method for the prevention of process component fouling within a liquid hydrocarbon stream, comprising the steps of:

- initiating an electric charge to one or more process components for contacting a liquid hydrocarbon stream, wherein said liquid hydrocarbon stream contains at least one contaminant;
- initiating a flow of the liquid hydrocarbon stream past the electric charge and the one or more process components;
- continuously applying the electric charge to the flowing liquid hydrocarbon stream; and
- then
- adjusting the electric charge as the liquid hydrocarbon stream flows in fluid communication with the one or more process components.

30. (Previously presented) The method according to Claim 29, wherein the one or more process components comprises a heat exchanger.

31. (Previously presented) The method according to Claim 30, wherein the electric charge is applied to a chassis or shell of said heat exchanger.
32. (Previously presented) A method for processing a liquid hydrocarbon process stream, comprising:
initiating a process run of a liquid hydrocarbon process stream through one or more process components adapted to exchange heat with the liquid hydrocarbon process stream;
initiating an electric charge to at least one of the one or more process components;
flowing the liquid hydrocarbon process stream in fluid communication with the at least one of the one or more process components having the electric charge applied thereto; and
continually applying the electric charge to the at least one of the one or more process components during the process run while the liquid hydrocarbon process stream is in fluid communication therewith.
33. (Canceled)
34. (Previously presented) The method according to Claim 32, further comprising adjusting the electric charge to the at least one of the one or more process components during the process run.
35. (Previously presented) The method according to Claim 32, wherein the one or more process components comprises a heat exchanger.
36. (Previously presented) The method according to Claim 35, wherein the electric charge is applied to a chassis of said heat exchanger.
37. (Previously presented) The method according to Claim 35, wherein the electric charge is applied to a shell of said heat exchanger.

38 (Previously presented) The method according to Claim 33, further comprising adjusting the electric charge to the at least one of the one or more process components during the process run.

39. (Canceled).

IX. Evidence Appendix

NONE.

X. Related Proceedings Appendix

NONE.